

2	BATTERY-GRID MAKING	16	RAILWAY-CHAIR MAKING
2.1	BIAS (I.E., HELICALLY) CUTTING OF TUBULAR STOCK	17.1	FOIL OR OTHER THIN SHEET-METAL MAKING OR TREATING
2.11	.Including orbital cutter	17.2	.Method
2.12	..Within stock support	17.3	..Clad or other composite foil or thin metal making
2.13	..With orbiting strip accumulator	17.4	..With assembling or disassembling of a pack
2.14	.Including means to inflate stock	17.5	...Using transitory solid cover material
2.15	.With means to feed stock along support or mandrel	17.6	...Including bond prevention treatment
2.16	..Single means produces compound motion	17.7	...Disassembling of a pack
2.17	...Endless belt drive means	17.8	..By shaving or longitudinal cutting
2.18	..Axially	17.9	..Using transitory material
2.19	..Rotatably	18.1	.Means for opening or separating a pack
2.2	.With means to rotate and store stock supply	20	SPECTACLE-FRAME MAKING
2.21	..Axis of rotation parallel to support or mandrel	20.1	SPIRAL CUTTING OF FLAT STOCK
2.22	.With means for arcuate shift of mandrel	21	STEREOTYPE-PLATE FINISHING
2.23	.Including means to handle produced strip or web	21.1	MEANS FOR FORMING CLENCH-TONGUE (E.G., FOR TIEBAND)
2.24	..With common adjustment for cutter	22	TIRE UPSETTING, WITH CUTTING, PUNCHING, ETC.
2.25	.Method	23.1	TOOTHED-CYLINDER MAKING APPARATUS (E.G., TEXTURE WORKING CYLINDER)
3	BUCKLE MAKING	23.51	IMPELLER MAKING APPARATUS
4	BUTTON-FASTENER MAKING	24	TYPE FINISHING AND GROOVING
4.51	SHREDDING METAL OR METAL WOOL ARTICLE MAKING	24.5	VENETIAN BLIND ASSEMBLING
4.52	.Metal wool making	25	UMBRELLA-FRAME MAKING
4.53	..Shaving or longitudinal cutting	25.01	BARRIER LAYER OR SEMICONDUCTOR DEVICE MAKING
4.54	...Soap-pad making	25.02	.Barrier layer device making
4.55	.Metal wool bundling	25.03	..Electrolytic device making (e.g., capacitor)
4.56	..Soap-pad making	25.35	PIEZOELECTRIC DEVICE MAKING
4.6	CORD HEDDLE MAKING	25.41	ELECTRIC CONDENSER MAKING
5	COTTER-PIN MAKING	25.42	.Solid dielectric type
6.01	CRANKSHAFT MAKING APPARATUS	76.1	FILING
6.1	EXPANDED METAL MAKING	76.2	.Of key article
6.2	.By use of reciprocating perforator	76.3	.Continuous band type
7	EYEBOLT OR HOOK MAKING	76.4	.Reciprocating type
7.1	FENCE BARB MAKING	77	.File-blank stripper
7.2	.By use of reciprocating cutter or die	81.01	SCALE REMOVER OR PREVENTOR
7.3	.By use of rotary cutter or die	81.02	.For hollow workpiece
8	FINGER-RING FORMING OR SIZING	81.021	..Interior surface
9	FISHHOOK MAKING	81.03	.Rolling deformation or deflection
10	GEM AND JEWEL SETTING	81.04	..For wire or rod
11	HINGE MAKING OR ASSEMBLING	81.05	.With rotary head
12	LACING-STUD MAKING	81.06	.Fluid impingement
13	PAPER-FASTENER MAKING		
14	PLOW OR CULTIVATOR IRON MAKING		
15	PUDDLERS` BALLS MAKING		

81.07	..With heater	603.03	....Making disc drive
81.08	..Liquid jet	603.04	....Mounting preformed head/core onto other structure
81.09	..Airblast	603.05	.....Mounting multitrack head
81.1	.Chainer	603.06	.....With bonding
81.11	..Scraper or scalper	603.07	....Fabricating head structure or component thereof
81.12	..Brush type	603.08	.....Treating to affect magnetic properties
81.13	..Mechanically powered operator	603.09	.....Including measuring or testing
81.14	..Tack or needle type	603.1	.....Using reference point/surface to facilitate measuring
81.15	..Hammer	603.11	.....With dual gap materials
81.16	..Blade or chisel	603.12	.....With significant slider/housing shaping or treating
81.17	..Hand tool	603.13	.....Depositing magnetic layer or coating
89.5	BURNING IN, WEARING IN, OR OIL BURNISHING	603.14	.....Plural magnetic deposition layers
90.01	BURNISHING	603.15	.....With etching or machining of magnetic material
90.1	..Of water laid fibrous article (e.g., paper)	603.16	....Machining magnetic material (e.g., grinding, etching, polishing)
90.2	..Heated burnishing member	603.17	.....Employing workholding means
90.3	...Burnishing tool reciprocates across work surface	603.18	.....By etching
90.5	..Continuous feed	603.19	....Multitrack heads having integral holding means
90.6	..Of gear article	603.2	....With bond/laminating preformed parts, at least two magnetic
90.7	..By shot peening or blasting	603.21	.....Using glass bonding material
91	UPHOLSTERED ARTICLE MAKING	603.22	.....With work positioning means
91.1	..Method	603.23	....Providing winding
91.2	..Tufting	603.24	.....Multilayered winding
91.3	..With means to clench fastener	603.25	.....By coating
91.4	..With means to insert guide pin or fastener	603.26	.....Preformed winding
91.5	..Cover stretching	603.27	....Specified diverse magnetic materials
91.6	..Edge-roll forming	604	...Data storage inductor or core
91.7	..Form or holder	605	...By winding or coiling
91.8	..With follower	606	...By assembling coil and core
592	METHOD OF MECHANICAL MANUFACTURE	607	...Including permanent magnet or core
592.1	..Electrical device making	608	....From comminuted material
593	..Including measuring or testing of device or component part	609	....Laminated
594	..Acoustic transducer	609.1	...Acoustic transducer
595	..Indicating transducer	610.1	..Resistor making
596	..Dynamoelectric machine	611	...Heater type
597	...Commutator or slip ring assembly	612	...Thermally variable
598	...Rotor		
599	..Superconductor		
600	..Antenna or wave energy "plumbing" making		
601	..With other electrical component		
602.1	..Electromagnet, transformer or inductor		
603.01	...Magnetic recording reproducing transducer (e.g., tape head, core, etc.)		
603.02	....Including disassembly step		

613	...With envelope or housing	845	.....With shaping or forcing terminal into base aperture
614	....Filling with powdered insulation	846	....Manufacturing circuit on or in base
615	.....With direct compression of powdered insulation	847	....With selective destruction of conductive paths
616	....Powdering the insulation	848	....With molding of insulated base
617	.....By oxidation	849	.....Simultaneous circuit manufacturing
618	....With winding	850	....By using wire as conductive path
619	....Applying terminal	851	....With sintering of base
620	...Coating resistive material on a base	852	....By forming conductive walled aperture in base
621	...Applying terminal	853	.....With deforming of conductive path
621.1	..Strain gauge making	854	...Assembling electrical component directly to terminal or elongated conductor
622	..Switch making	855	...With encapsulating
623	..Fuse making	856	....By molding of insulating material
623.1	..Electric battery cell making	857	...Assembling terminal to elongated conductor
623.2	...Including sealing	858	...With molding of electrically insulating material
623.3	...Including laminating of indefinite length material	859	.....By shrinking of cover
623.4	...Including adhesively bonding	860	...By metal fusion bonding
623.5	...Including coating or impregnating	861	...By deforming
825	..Conductor or circuit manufacturing	862	.....Of ferrule about conductor and terminal
826	...Brush	863	.....Of terminal
827	...Beam lead frame or beam lead device	864	.....With forming eyelet from elongated conductor
828	...Co-axial cable	865	.....With penetrating portion
829	...On flat or curved insulated base, e.g., printed circuit, etc.	866	.....Through insulation
830	....Assembling bases	867	.....With insulation removal
831	....Assembling formed circuit to base	868	...Assembling elongated conductors, e.g., splicing, etc.
832	....Assembling to base an electrical component, e.g., capacitor, etc.	869	...With end-to-end orienting
833	.....By utilizing optical sighting device	870	....Including fluid evacuating or pressurizing
834	.....With component orienting	871	....Including deforming of joining bridge
835	.....And shaping, e.g., cutting or bending, etc.	872	...With overlapping orienting
836	.....Different components	873	....Including oppositely facing end orienting
837	....By inserting component lead or terminal into base aperture	874	...Contact or terminal manufacturing
838	.....With deforming of lead or terminal	875	...By powder metallurgy
839	.....Including metal fusion	876	...By assembling plural parts
840	....By metal fusion	877	.....With bonding
841	....With encapsulating, e.g., potting, etc.	878	.....Of fused material
842	...Assembling terminal to base		
843	....By metal fusion bonding		
844	....By deforming or shaping		

879	.....Metal	888.072	...Including casting or molding
880	.....By impregnating a porous mass	888.073	...Including rolling or die forming, e.g., drawing, punching
881	....By elastic joining	888.074	...Including coating or plating
882	....With deforming	888.075	...Including grinding or honing
883	....With molding of insulation	888.076	...Including machining or angular cutting
884	....Forming array of contacts or terminals	888.08	..Crankshaft making
885	...With coating	888.09	..Connecting rod making
886	..Electret making	888.091	...Including metallurgical bonding
887	..Insulator making	888.092	...Including metal forging or die shaping
888	..Prime mover or fluid pump making	888.1	..Camshaft making
888.01	..I.C. (internal combustion) engine making	888.2	..Push rod or rocker arm making
888.011	...Repairing, converting, servicing or salvaging	888.3	..Seal or packing making
888.012	...Rotary or radial engine making	888.4	..Poppet or I.C. engine valve or valve seat making
888.02	..Fluid pump or compressor making	888.41	...Valve guide making
888.021	...Repairing, converting, servicing or salvaging	888.42	...Repairing, converting, servicing or salvaging
888.022	...Scroll or peristaltic type	888.43	...Valve tappet making
888.023	...Screw or gear type, e.g., Moineau type	888.44	...Valve seat making
888.024	...Centrifugal type	888.45	...Composite or hollow valve stem or head making
888.025	...Vane type or other rotary, e.g., fan	888.451	....Including forging
888.03	..Valve lifter making	888.452	....Including extruding
888.04	..Piston making	888.453	....Including casting
888.041	...Repairing, converting, servicing or salvaging	888.46	...With assembly or composite article making
888.042	...Multi-element piston making	889	..Impeller making
888.043	....Utilizing a high energy beam, e.g., laser, electron beam	889.1	..Repairing or disassembling
888.044	...With assembly or composite article making	889.2	..Turbomachine making
888.045	....With thermal barrier or heat flow provision	889.21	...Assembling individual fluid flow interacting members, e.g., blades, vanes, buckets, on rotary support member
888.046	....With fiber reinforced structure	889.22	...Assembling fluid flow directing devices, e.g., stators, diaphragms, nozzles
888.047	....By composite casting or molding	889.23	...Shaping integrally bladed rotor
888.048	....By coating or cladding	889.3	..Axial blower or fan
888.049	..Ring groove forming or finishing	889.4	..Centrifugal blower or fan
888.05	...Gudgeon pin, wrist pin, piston pin, or boss therefor	889.5	..Fluid coupling device
888.051	...With other attaching provision for connecting rod	889.6	..Propeller making
888.06	..Cylinder, cylinder head or engine valve sleeve making	889.61	...Utilizing hollow tube blank
888.061	...With liner, coating, or sleeve	889.7	..Blade making
888.07	..Piston ring or piston packing making	889.71	...Composite blade
888.071	...Including forging or hammering	889.72	...Hollow blade
		889.721	....With cooling passage
		889.722	....Passage contains tubular insert
		890	..Catalytic device making

- 890.01 ..Rocket or jet device making
- 890.02 ..Burner, torch or metallurgical lance making
- 890.03 ..Heat exchanger or boiler making
- 890.031 ..Repairing, converting, servicing or salvaging
- 890.032 ..Heat pipe device making
- 890.033 ..Solar energy device making
- 890.034 ..Regenerator or recuperator making
- 890.035 ..Cooling apparatus making, e.g., air conditioner, refrigerator
- 890.036 ..Tube inside tube
- 890.037 ..Tube wound about tube
- 890.038 ..Tube joined to flat sheet longitudinally, i.e., tube sheet
- 890.039 ..Sheet joined to sheet
- 890.04 ..With inserted tubes
- 890.041 ...Utilizing bond inhibiting material
- 890.042With subsequent fluid expansion
- 890.043 ..Tube joint and tube plate structure
- 890.044 ...Including conduit expansion or inflation
- 890.045 ..Tube with heat transfer means
- 890.046 ..Finned tube
- 890.047Common fin traverses plurality of tubes
- 890.048Helically finned
- 890.049Internally finned
- 890.05Made from unitary workpiece, i.e., no assembly
- 890.051 ..Boiler making
- 890.052 ..Header or manifold making
- 890.053 ..Tube making or reforming
- 890.054 ..With metallurgical bonding
- 890.06 ..Accumulator making
- 890.07 ..Condenser, evaporator or vaporizer making
- 890.08 ..Muffler, manifold or exhaust pipe making
- 890.09 ..Fluidic or fluid actuated device making
- 890.1 ..Fluid pattern dispersing device making, e.g., ink jet
- 890.11 ..Tapping device making
- 890.12 ..Valve or choke making
- 890.121 ..Repairing, converting, servicing or salvaging
- 890.122 ..Valve seat forming
- 890.123 ..Valve stem or tire valve making
- 890.124 ..With assembly, disassembly or composite article making
- 890.125 ...Joining plural semi-circular components
- 890.126 ...With material shaping or cutting
- 890.127Including molding or casting
- 890.128Including machining or drilling
- 890.129Including metallurgical bonding
- 890.13Including metal deforming
- 890.131 ...Including metallurgical bonding
- 890.132 ..Including metal shaping and diverse operation
- 890.14 ..Gas and water specific plumbing component making
- 890.141 ..Plumbing fixture making
- 890.142 ..Nozzle making
- 890.143 ...Sprayer
- 890.144 ..Flexible conduit or fitting therefor
- 890.145 ..Flue connector device making
- 890.146 ..Trap making
- 890.147 ..Return connector device making
- 890.148 ..T-shaped fitting making
- 890.149 ..Elbow or L-shaped fitting making
- 890.15 ..Ferrule making or reforming
- 891 ..Agricultural device making
- 891.1 ..Traction apparatus, e.g., for tractor
- 891.2 ..Harvester guard
- 892 ..Pulley making
- 892.1 ..Assembly
- 892.11 ...With shaping
- 892.2 ..Disc splitting to form pulley rim groove
- 892.3 ..Groove forming in sheet metal pulley rim
- 893 ..Gear making
- 893.1 ..Assembling of gear into force transmitting device
- 893.2 ..Gear mounting
- 893.3 ..Gear shaping
- 893.31 ...Worm gear
- 893.32 ...Roll forming
- 893.33 ...Punching or stamping
- 893.34 ...Die-press shaping
- 893.35 ...Gear tooth cutting
- 893.36 ...Gear blank making
- 893.37 ...With specific gear material
- 894 ..Wheel making

- 894.01 ..Railway or trolley wheel making
894.011 ...Multiple part or composite
894.012With axle or hub
894.1 ..Steering wheel
894.2 ..Material winding, e.g., reel, spool
894.3 ..Land wheel
894.31 ...Assembling tire to wheel body
894.32 ...Disc type wheel
894.321Assembling wheel disc to rim and hub
894.322Assembling wheel disc to rim
894.323With disc shaping
894.324Integral rim and disc making
894.325Disc shaping
894.33 ...Tensioned spoke type wheel making
894.331Tensioning all spokes simultaneously
894.332Tensioning spokes in series
894.333Tensioning spokes individually
894.34 ...Compression, e.g., nontension, spoke type wheel making
894.341Joining spokes to rim and hub
894.342Joining spokes to rim
894.343Joining spokes to hub
894.344Making plural spokes from a single blank
894.345Individual spoke making
894.35 ...Rim making
894.351With assembling
894.352Demountable rim making
894.353Die-press shaping
894.354Roller forming
894.36 ...Hub making
894.361 ...With assembling
894.362 ...Hub shaping
894.37 ...Tire making
894.38 ...Wheel trim making, e.g., wheel cover, hubcap
894.381With means for retaining trim member on wheel
895 ..Roller making
895.1 ..Repairing or servicing
895.2 ..Assembling preformed components
895.21 ...Work contacting surface element assembled to core
895.211Work contacting surface wound about core
895.212With prestressing of component by heat differential, e.g., shrink, fit
895.213Work contacting surface having annular axial sections
895.22 ...Work contacting surface element assembled to end support members
895.23 ...Includes securing removable cover on roller
895.3 ..Fabricating and shaping roller work contacting surface element
895.31 ...Toothed roller
895.32 ...With coating or casting about a core
895.33 ..One-piece roller making
896.1 ..Dental appliance making
896.11 ..Orthodontic device making
896.2 ..Sound device making
896.21 ..Hearing aid component making
896.22 ..Musical instrument or tuning fork making
896.23 ..Including diaphragm or support therefor
896.24 ..Phonograph component making
896.3 ..Watch or clock making
896.31 ..Having arbor, pinion, or balance
896.32 ..Having indicia, face, or dial
896.33 ..Having case, cover, or back
896.34 ..Having crown, stem, or pendent
896.4 ..Jewelry or locket making
896.41 ..Human adornment device making
896.411 ...Bracelet making
896.412 ...Finger ring making
896.42 ..Latch, clasp, or fastener component making
896.43 ..Ornamental stock making
896.5 ..Knob or knob shank making
896.6 ..Multiperforated metal article making
896.61 ..Coil wound wall screen
896.62 ..Filter
896.7 ..Turnbuckle making
896.8 ..Spring-head clip making
896.9 ..Spring making
896.91 ..For vehicle or clutch
896.92 ..For human comfort
896.93 ..Resilient shock or vibration absorber utility
897 ..Structural member making
897.1 ..Restoring existing member, e.g., reinforcing, repairing
897.15 ..Grille making
897.2 ..Vehicular structural member making

897.3	..Static structure, e.g., a building component	898.068	....Roller making
897.31	...Openwork, e.g., a truss, joist, frame, lattice-type or box beam	898.069	....Ball making
897.312	....Frame component	898.07	..Mounting
897.32	...Panel	898.08	..Demounting
897.33	...Columnar member	898.09	..Pre-usage process, e.g., preloading, aligning
897.34	..Metal reinforcement member for nonmetallic, e.g., concrete, structural element	898.1	..Lubricating
897.35	...Beam or girder	898.11	..Sealing
898	..Process for making bearing or component thereof	898.12	..Coating or casting
898.01	..Repairing	898.13	..Bearing surface treatment
898.02	..Fluid bearing	898.14	..Specific metallic composition
898.03	..Linear bearing	898.15	..Nonmetallic bearing element
898.04	..Rotary bearing	899	..Ball making
898.041	...Thrust bearing	899.1	..Hollow ball
898.042	...Plain bearing	401.1	..Converting
898.043	....Self-adjusting or self-aligning, including ball and socket type, bearing and component making	402.01	..Repairing
898.044	.....Deforming socket to secure ball	402.02	..Seal or element thereof
898.045	.....Die-press shaping	402.03	..With disassembling
898.046	.....Having liner	402.04	...Including reconditioning of part
898.047	.....Having liner	402.05	....By shaping
898.048	.....Socket making	402.06	.....Removing material
898.049	.....By molding or casting	402.07	.....And by a metallurgical operation, e.g., welding, diffusion bonding, casting
898.05	.....Nonmetallic socket	402.08	...Replacing of defective part
898.051	.....By assembling	402.09	..By attaching repair preform, e.g., remaking, restoring, or patching
898.052	.....Ball making	402.11	...And removing damaged material
898.053	.....With metallurgical bonding	402.12	...Mechanically attaching preform with separate fastener
898.054	....Sleeve or bushing making	402.13	...Metallurgically attaching preform
898.055	....Nonmetallic	402.14	..Mechanically attaching preform by separate fastener
898.056	....Strip or blank material shaping	402.15	...Screw threaded fastener
898.057	.....Die-press shaping	402.16	...Metallurgically attaching preform
898.058	.....Having inner lining layer	402.17	...Screw threaded preform
898.059	.....Having liner	402.18	..By applying fluent material, e.g., coating, casting
898.06	..Anti-friction bearing or component thereof	402.19	..By shaping, e.g., bending, extruding, turning, etc.
898.061	...Assembling of race, cage, and rolling anti-friction members	402.21	...Including heating
898.062	...Assembling of race and rolling anti-friction members	403.1	..Scrap recovering or utilizing
898.063	....With race making	403.2	..Metalworking to consolidate scrap
898.064	....Assembling of cage and rolling anti-friction members	403.3	..Separating one material from another
898.065	....With cage making	403.4	...By burning or heating
898.066	....Race making	404	..During simulated operation or operating conditions
898.067	....Cage making	405	..Temperature

406	.Center locating and shaping	426.1	.Disassembling
407.01	..With testing or indicating	426.2	..With other than ancillary treating or assembling
407.02	..Torquing threaded assemblage or determining torque herein	426.3	..With conveying of work or disassembled work part
407.03	...Determining relative number of threaded member rotations	426.4	..By altering or destroying work part or connector
407.04	..Using optical instrument (excludes mere human eyeballing)	426.5	..By applying force
407.05	..Quantitative measuring or gauging	426.6	...To elastically deform work part or connector
407.06	...By radioactive tracing	428	.Assembling or joining
407.07	...By vibratory or oscillatory movement	429	..Progressively advancing of work assembly station or assembled portion of work
407.08	...Pressure, force, or weight determining	430	...Advancing work to successive stations (i.e., assembly line)
407.09	..With aligning, guiding, or instruction	431	...Advancing station
407.1	...Assisting assembly or disassembly	432	..Punching, piercing or reaming part by surface of second part
408	.Of a slide fastener	432.1	...With shaping
409	..Of slider	432.2	....Of first part
410	..Of interlocking element	433	..By stringing
411	.Obtaining plural composite product pieces from preassembled workpieces	434	..Retaining clearance for motion between assembled parts
412	.Obtaining plural product pieces from unitary workpiece	435	...Between tube-forming helical coils
413	..Breaking through weakened portion	436	...Through resilient media
414	..Dividing through modified portion	437	...By deforming interlock
415	..Dividing on common outline	438	....By folding part into plural ears
416	..Coacting pieces	439	....By wrapping around
417	..Dividing sequentially from leading end, e.g., by cutting or breaking	440	.....Of link closure
418	.Providing transitory integral holding or handling portion	441.1	....Of sphere, i.e., ball, in socket
419.1	.Shaping fiber or fibered material	441.2	....Ball point pen making
419.2	.Magnetically shaping	442	....Allowing assembled sphere to move in single plane only
421.1	.Shaping by direct application of fluent pressure	443	...Of flange into tubular socket
421.2	..Explosively shaping	444	...Outwardly deforming internally fitted rod
422	.Shaping container end to encapsulate material	445	..Sizing mating parts during final positional association
423	.Utilizing transitory attached element or associated separate material	446	..With prestressing of part
424	..Temporary protective coating, impregnation, or cast layer	447	...By temperature differential (e.g., shrink fit)
425	.Shaping mating parts for reassembly in different positions	448	...Of skin on frame member
		449	....By flexing
		450	...Elastic joining of parts
		451	....Confining elastic part in socket
		452	...Prestressing rod, filament or strand
		453	...By snap fit

454	..Of flexible wall, expansible chamber devices (e.g., bellows)	518	.....Joined to overlapping ends of plural rods
455.1	..Spaced wall tube or receptacle	519	.....After thinning
456	..Of separate helix (e.g., screw thread)	520	....By axially applying force
457	..Ribbing	521	...Surface interlocking
458	..With coating before or during assembling	522.1	...Radially expanding part in cavity, aperture, or hollow body
459	...To roughen surface	523	...Radially expanding internal tube
460	..Subsequently coating	524	...Peripheral edge joining of abutting plates
461	..With spreading of cable strands	524.1	...Riveting
462	..Joining plate edge perpendicularly to frame	525	..By driven force fit
463	..Peripheral joining of opposed mirror image parts to form a hollow body	525.01	..By applying separate fastener
464	..Associating parts by use of aligning means (e.g., use of a drift pin or a "fixture")	525.02	...Multipart cooperating fastener (e.g., bolt and nut)
465	...Registering mating opposed tool parts (e.g., registering a punch and a cooperating die)	525.03	...Nonthreaded
466	...By multiple cooperating aligning means	525.04	....At least one part is nonmetallic
467	...Sequentially associating parts on stationary aligning means	525.05	...Fastener deformed after application
468	...By manipulating aligning means	525.06	...Riveting
469	..Assembling a subassembly, then assembling with a second subassembly	525.07	....At least one part nonmetallic
469.5	..Metal deforming with nonmetallic bonding	525.08	...Nonresilient fastener
505	..Joining by deforming	525.09	....At least one part nonmetallic
506	..Securing cup or tube between axially extending concentric annuli	525.11	...Threaded fastener
507	....By expanding inner annulus	525.12	....At least one part nonmetallic
508	....By constricting outer annulus	525.13	...With supplemental joining
509	...Overedge assembling of seated part	525.14	...Metal fusion joining
510	....By necking in cup or tube wall	525.15	....At least one part nonmetallic
511	.....At cup or tube end	526.2	.With separating, localizing, or eliminating of as-cast defects from a metal casting (e.g., anti-pipe)
512	....By flaring inserted cup or tube end	526.3	..Compressing ingot while still partially molten
513	....By bending over projecting prongs	526.4	..Removing defects
514	...Of parallel side-by-side elongated members	526.5	...From center of ingot to leave hollow blank
515	...Inward deformation of aperture or hollow body wall	526.6	...After deforming
516	....Hollow body is axially joined cup or tube	527.1	.Combined manufacture including applying or shaping of fluent material
517	.....Joined to rod	527.2	..Coating
		527.3	...And casting
		527.4	...Subsequent to metal working
		527.5	..Metal casting
		527.6	...Followed by cutting or removing material
		527.7	...Combined with rolling
		530	..Filling of opening
		557	.Shaping one-piece blank by removing material

- 558 ..Successive distinct removal operations
- 559 .Work holding
- 560 **CONVERTIBLE METAL WORKING MACHINE**
- 560.1 .Vise type
- 33 R **PLURAL DIVERSE MANUFACTURING APPARATUS INCLUDING MEANS FOR METAL SHAPING OR ASSEMBLING**
- 33.2 .Slide fastener or slide fastener element
- 33.5 .Binding or covering and cutting
- 33.52 ..Cutting covering material only
..Type of machine
- 26 R ..Drill press
- 26 A ...Drilling and other
- 26 B ...Portable
- 27 R ..Lathe
- 28 ...Grinding attachment
- 29 ...Pulley or wheel
- 27 A ...Convertible
- 27 B ...Commutator
- 27 C ...Lathe and tool
- 30 ..Planer
- 34 R .Forging and bending, cutting or punching
- 34 A ..Fastener (zipper)
- 34 B ..Riveting
- 34 C ..Ball making
- 34 D ..Wire working
- 561 ..With means to feed work during tool contact
- 562 ..Including nonrotary flying tool
- 563 ..With means to feed work intermittently from one tool station to another
- 37 R ..Stock turret
- 37 A ...Swiss type
- 38 R ..Blank turret
- 38 A ...Rotary work - vertical axis
- 38 B ...Rotary work - horizontal axis
- 38 C ...Stationary work
- 38 D ...Belt drive
- 38 E ...Crankshaft
- 38 F ...Collapsible tube
- 38.9 ..Endless belt
- 564 .Separate tool stations for selective or successive operation on work
- 564.1 ..Including assembling or disassembling station
- 564.2 ...And means to machine work part to fit cooperating work part
- 564.3 ...And means to sever work prior to disassembling
- 564.4Comprising means to strip insulation from wire
- 564.5 ...And means to stake electric wire to commutator or armature in assembling of electric motor or generator
- 564.6 ...And means to sever work from supply
- 564.7 ...And means to machine product
- 564.8To sever product to length
- 565 .Common reciprocating support for spaced tools
- 566 .Including composite tool
- 566.1 ..Including severing means
- 566.2 ...To sever electric terminal from supply strip
- 566.3 ...To trim electric component
- 566.4Means comprising hand-manipulatable implement
- 35.5 .With turret mechanism
- 36 ..Multiple turret
- 39 ..Tool turret
- 40 ...Rotary tool holder
- 41 ...Sliding tool holder
- 42 ...Fluid operated
...Cam operated
....Longitudinal turret axis
....Transverse turret axis
...Lever operated
...Rack-and-pinion operated
...Screw operated
- 48.5 R ..Including rotating and/or locking means
- 49 ...Frictional and positive
- 48.5 A ...Lock means for tool or work turrets
- 50 .Multiple-tool holder
- 51 ..Laterally movable stock holder
- 52 ..Axial tool and transversely movable slide rest
- 53 ...Rotary tool spindle
- 54 ..Longitudinally and transversely movable
- 55 ...Rotary tool spindle
- 56 ..Oscillating tool
- 56.5 .Including machining means
- 56.6 ..And work-holder for assembly
- 57 .Attachment
- 64 .Speed controller
- 65 .Carriage stop mechanism
- 33 A .Flash remover
- 33 B .Welding strip ends
- 33 C .Casting and working
- 33 D .Tube making

33 E	.Covering	720	.With signal, scale, illuminator, or optical viewer
33 F	.Wire working		
33 G	.Radiator making	721	..For work-holder for assembly or disassembly
33 H	.Printing plate		
33 J	.Turret	722	.Including means to provide a controlled environment
33 K	.Assembly		
33 L	.Armature	723	.Nuclear device
33 M	.Electrical connector or terminal	724	.Roller or ball bearing
33 N	.Tire valve or spark plug	725	..Including deforming means
33 P	.Multiple station with conveyor	726	.Heat exchanger
33 Q	.Multiple stations working strip material	726.5	..Including means to manipulate heat exchanger tube bundle
33 S	.Continuous strip	727	..Including deforming means
33 T	.Work on tubes	728	.Means to place sheath on running-length core
650	PLURAL DIVERSE MANUFACTURING APPARATUS	729	.Means to assemble electrical device
700	MEANS TO ASSEMBLE OR DISASSEMBLE	730	..Storage cell or battery
701	.With means to regulate operation by use of templet, tape, card or other replaceable information supply	731	...Including deforming means
		732	..Motor or generator
702	..With comparator	733	...Means to assemble commutator
703	...Computer input	734	...Means to position insulation
704	..Web or strand-carried information supply	735	...Means to stake wire to commutator or armature
		736	...Including deforming means
705	.With means to test work or product	737	..Magnetic memory device
		738	..Laminated device
706	.With randomly actuated stopping or disabling means	739	..Means to fasten electrical component to wiring board, base, or substrate
707	..Responsive to condition of work or product	740	...Chip component
708	..Responsive to operative (e.g., safety device, etc.)	741	...Multilead component
		742	..Multiple station assembly apparatus
709	.With control means energized in response to activator stimulated by condition sensor	743	..Means to apply vacuum directly to position or hold work part
710	..Including means to divert defective work part	744	..Means to apply magnetic force directly to position or hold work part
711	..Multiple station assembly or disassembly apparatus	745	..Conductor
		746	...Electrode
712	...Including position sensor	747	...Terminal or connector
713	..Responsive to timer	748	...Assembled to wire-type conductor
714	..Responsive to work or work-related machine element	749	....Means to simultaneously assemble multiple, independent conductors to terminal
715	...With means to fasten by deformation		
716	....Self-piercing work part	750	....Means comprising hand-manipulatable implement
717	...With means to fasten by elastic joining	751	.....Fastening by deformation
718	..With means to fasten by frictional fitting	752	.....Fastening by elastic joining
719	...Including means to apply magnetic force directly to position or hold work	753	....Means to fasten by deformation

754	.....Means to fasten by elastic joining	790	...By friction fit
755	..Multiple, independent conductors	791	.Multiple station assembly or disassembly apparatus
756	...Switch or fuse	792	..Including turret-type conveyer
757	..Means to simultaneously fasten three or more parts	793	..Including converging conveyers
758	..Means comprising hand-manipulatable implement	794	...And primary central conveyer
759	..Means to align and advance work part	795	..Means to fasten work parts together
760	..With work-holder for assembly	796	...By deforming
761	..Means to fasten by deforming	797	...By elastic joining
762	..Means to disassemble electrical device	798	.Means to drive self-piercing work part
763	..Storage cell or battery	799	.Including assembly pallet
764	..Means comprising hand-manipulatable implement	800	.Including provision to utilize thermal expansion of work
765	..Means to place traveler on ring or ring on bobbin of a textile machine	801	.Means to assemble or disassemble container and fluid component
766	.Slide fastener	802	.Vehicle wheel
767	..Means to assemble stop onto stringer	803	..Railway wheel
768	..Means to assemble slider onto stringer	804	.Tumbler lock
769	..Means to assemble teeth onto stringer	805	.Toy doll
770	..Disassembly means	806	.Film or tape cartridge
771	..Means to interrelatedly feed plural work parts from plural sources without manual intervention	807	.Crystal to watch or clock
772	..Box or pallet assembly means	808	.Means to insert or extract pen point
773	..Means to assemble container	809	.With magazine supply
774	..Handle to container	810	..And magnetic work-holder or positioner
775	...Label to container	811.2	..Assembling means comprising hand-manipulatable implement
776	..Pressurized dispensing container	812	...One work part comprising living tissue
777	..Hypodermic syringe	812.5	...Comprising driver for snap-off-mandrel fastener; e.g., Pop (TM) riveter
778	...Including fluid component	813	...One work part comprising nut or screw
779	..Running-length work	814	...One work part comprising paper clip
780	...Means including orbiting running-length work supply	815	...Means to assemble tire stud into tire tread
781	...Pipe section	816	...Means to fasten by deforming
782	...Assembled to article	817	...Fastening sinker to fishing line
783	..Multiple station assembly apparatus	818	..Means to fasten by deforming
784	..Including assembly pallet	819	.Running-length work
785	..Including turret-type conveyer	820	..Assembled on core
786	..Including converging conveyers	821	.Including means to vibrate work
787	..And means to fasten work parts together	822	.Including work conveyer
788	...By deforming	823	..Including transporting track
789	...By elastic joining	824	...And work carrying vehicle
		213.1	.Valve applying or removing
		214	..Engine valve unit puller or applier

215	..Engine valve spring compressor (only)	243.522	.....Including near side fastener shaping tool
216	...Plural spring engagement	243.523	.....Pneumatic- or fluid-actuated tool
217	...Screw operated	243.524	.....Liquid
218	....Parallel or tong type, side entrance	243.525	.....And gas
219	...Lever operated	243.526	.....Having rotary drive mechanism
220	....Single jaw or valve engagement	243.527	....Having allochiral actuating handles
221	....Plier type	243.528	....Having repositionable annulus engaging tool
221.5	..To or from wheel rim of resilient tire or tube	243.529	....Including near side fastener shaping tool
221.6	..Removal tool	243.53	..Riveter
222	..Piston ring inserter or remover	243.54	...Single header
223	..Plier-type operation	243.55	....Pipe joiner
224	..With ring encirclement	243.56	..Clip applicator
225	..Spring applicator or remover	243.57	..Binding or covering
226	..Transmission spring	243.58	...Edge binding
227	..Helical spring	244	..Puller or pusher means, contained force multiplying operator
228	..Flat spiral spring (e.g., watch or clock type)	245	..Hubcap and hub
229	..Circular spring	246	..Battery post and terminal
230	..Leaf spring	247	..Cotter pin and cooperating member
231	..Means to stake watch or clock	248	...Plier type means
232	..Plier type	249	..Valve stem pin or key and another member
233	..Brake lining to brake shoe	250	..Machine key and another member
234	..Tube and coextensive core	251	..Arbor-type press means
235	..To apply or remove a resilient article (e.g., tube, sleeve, etc.)	252	..Having fluid operator
235.5	..Nipple to nursing bottle	253	..Having wedge operator
236	..Well protector to sucker rod	254	..Having percussion or explosive operator
237	..Coupling to conduit	255	...Tube, sleeve, or ferrule inserting or removing
237.5	..Loose-leaf sheet binder	256	..Having screw operator
238	..Compressing parts together face to face	257	...C-frame
239	..Spreading parts apart or separating them from face to face engagement	258	...Central screw, work-engagers around screw
240	..By rotation of work part	259	...Work-engager arms along or parallel to screw
240.5	..Means to insert or remove helix	260	....With arm connecting engaging means
241	..Means to string	261	.....Pivotal arms
242	..Tool handle and tool	262	.....Pivotal grippers on screw
243	..Tool chuck and tool	263	....Tubular or tube segment forms work-engager
243.5	..Overedge assembling means	264	....Screw threaded work-engager
243.51	..Belt-hook attacher	265	....Movable grippers on screw
243.517	..Annular work	266	....Plate or bar forms work-engager
243.518	...With radially acting tool inside annular work		
243.519	...With second workpiece inside annular work one workpiece moved to shape the other		
243.521	....Comprising driver for snap-off-mandrel fastener; e.g., Pop (TM) riveter		

267 ..Having lever operator
 268 ...Plier type means
 269 .Means comprising piston ring
 group contractor or holder
 270 .Means comprising hand
 manipulatable tool
 271 ..Aligner or center
 272 ...Tube with tube
 273 ...Auto wheel with auto chassis
 274 ...Clutch plates
 275 ..Means comprising impact
 receiving tool
 276 ...C-frame
 277 ...Thread protector (e.g., wheel
 axle type)
 278 ..Hand gripper for direct push or
 pull
 279 ...Centrifugal separator
 280 ...Tube sleeve or ferrule
 applying or removing
 281Thread-tapping grip
 281.1 .With work-holder for assembly
 281.2 ..For assembling a luminescent
 mantle
 281.3 ..And assembling press (e.g.,
 truss assembling means, etc.)
 281.4 ..Having means to permit support
 movement while work is thereon
 281.5 .Including means to relatively
 position plural work parts
 281.6 .Work-supported apparatus
 282 .Tube, sleeve or ferrule
 283 .Work gripper, anvil, or element
 283.5 .By deforming
 284 **MISCELLANEOUS APPARATUS**

CROSS-REFERENCE ART COLLECTIONS

900 **METHODS AND APPARATUS FOR
 ASSEMBLY BY ELECTROSTATIC
 ATTRACTION**
 901 **BALANCING METHOD**
 902 **FILTER MAKING**
 903 **FIREARM BOLT MAKING**
 904 **LAMINATED METAL ARTICLE MAKING**
 905 **MAKING COIL WOUND WALL SCREEN**
 906 **NUCLEAR DEVICE MAKING**

FOREIGN ART COLLECTIONSFOR 000 **CLASS-RELATED FOREIGN DOCUMENTS****DIGESTS**

DIG 1 **METHOD OR APPARATUS INVOLVING
 ADHESIVE**
 DIG 2 **METHOD OR APPARATUS USING
 ALUMINUM**
 DIG 3 **METHOD OR APPARATUS WITH BENDING**
 DIG 4 **METHOD OR APPARATUS WITH BRAZING**
 DIG 5 **METHOD OR APPARATUS WITH CASTING**
 DIG 6 **METHOD OR APPARATUS WITH
 CENTRIFUGAL CASTING**
 DIG 7 **METHOD OR APPARATUS WITH CLEANING**
 DIG 8 **METHOD OR APPARATUS WITH
 COMPOSITE CASTING**
 DIG 9 **METHOD OR APPARATUS WITH CUP
 FORMED AND BOTTOM REMOVED**
 DIG 10 **METHOD OR APPARATUS WITH DIE
 CASTING**
 DIG 11 **METHOD OR APPARATUS WITH DRAWING**
 DIG 12 **METHOD OR APPARATUS WITH
 ELECTROPLATING**
 DIG 13 **METHOD OR APPARATUS WITH ELECTRIC
 HEATING**
 DIG 14 **METHOD OR APPARATUS WITH
 ENAMELING**
 DIG 15 **FORMING ARTICLE ON END OF LONG
 STOCK AND THEN CUTTING OFF**
 DIG 16 **METHOD OR APPARATUS WITH ETCHING**
 DIG 17 **METHOD OR APPARATUS WITH MAKING
 FLOW LINES; CRYSTALS**
 DIG 18 **METHOD OR APPARATUS WITH FORGING**
 DIG 19 **METHOD OR APPARATUS WITH GRINDING**
 DIG 20 **METHOD OR APPARATUS FOR DOUBLE
 BLANK**
 DIG 21 **METHOD OR APPARATUS FOR HEATING**
 DIG 22 **METHOD OR APPARATUS USING INDIUM**
 DIG 23 **METHOD OR APPARATUS WITH KNURLING**
 DIG 24 **METHOD OR APPARATUS WITH LOCAL
 HEATING**
 DIG 25 **METHOD OR APPARATUS WITH
 PARTICULAR MATERIAL**
 DIG 26 **METHOD OR APPARATUS WITH
 MACHINING**
 DIG 27 **METHOD OR APPARATUS USING
 MAGNESIUM**
 DIG 28 **MAGNETIC RECORDING DIGEST**
 DIG 29 **MOLDING WITH OTHER STEP**
 DIG 30 **ORNAMENTING WITH OTHER STEP**
 DIG 31 **PRESSING POWDER WITH OTHER STEP**
 DIG 32 **ROLLING WITH OTHER STEP**

DIG 33	SCORING WITH OTHER STEP	DIG 81	GAS AS A CONVEYOR
DIG 34	SCALING WITH OTHER STEP	DIG 82	AIR CURRENT GENERATED BY CUTTER
DIG 35	SHRINK FITTING WITH OTHER STEP	DIG 83	FAN COAXIAL WITH CUTTER
DIG 36	SHOT BLASTING WITH OTHER STEP	DIG 84	VACUUM EXHAUST TYPE
DIG 37	STAMPING WITH OTHER STEP	DIG 85	WITH FLUID CONTROL VALVE
DIG 38	SPOT WELDING WITH OTHER STEP	DIG 86	HOOD ENCASED CUTTER
DIG 39	SPRAYING WITH OTHER STEP	DIG 87	MULTIPLE FLUID PATHS
DIG 40	STRIPS OF REPEATED ARTICLES - CUT UP LATER	DIG 88	BY PROJECTING, SQUIRTING OR DRIPPING
DIG 41	TAPER TUBE MAKING	DIG 89	GAS ENTRAINED LIQUID SUPPLY
DIG 42	TENSION APPLIED DURING WORKING	DIG 90	ELEVATED TANK SUPPLY
DIG 43	UPSETTING AND FLANGING TUBE END	DIG 91	PLURAL DISCHARGE OPENINGS
DIG 44	VACUUM	DIG 92	FLUID CHANNEL IN CUTTER
DIG 45	TITANIUM	DIG 93	PLURAL DISCHARGE LOCI
DIG 46	VIBRATION	DIG 94	DEBRIS REMOVER, CATCHER, OR DEFLECTOR
DIG 47	EXTRUDING WITH OTHER STEP	DIG 95	MAGNETIC OR ELECTROSTATIC
DIG 48	WELDING WITH OTHER STEP	DIG 96	MECHANICAL REMOVAL ASSISTANT
DIG 49	WORK HARDENING WITH OTHER STEP	DIG 97	CUTTER ENGAGING CLEANER
DIG 50	CUTTING FLUID APPLICATION AND DEBRIS CONTROL	DIG 98	ROTATING, RECIPROCATING OR OSCILLATING CLEANER
DIG 51	POWER STOP CONTROL FOR MOVABLE ELEMENT	DIG 99	FLEXIBLE CONVEYOR
DIG 52	CHIP BREAKER	DIG 100	SCREW OR CAM CONVEYOR
DIG 53	WORKPIECE AND DEBRIS SEPARATOR	DIG 101	PAN, BED, OR TABLE
DIG 54	FLUID CONTROL INTERRELATED WITH MACHINE TOOL MECHANISM	DIG 102	DEBRIS CHUTE
DIG 55	WITH CUTTER DRIVE	DIG 104	TOOL OR WORK ATTACHED
DIG 56	WITH SHIELD OR HOOD MOVEMENTS	DIG 105	ASSEMBLY, MAGNETIC, OR INDICIA TOOL
DIG 57	WITH CUTTER FEED		
DIG 59	HOOD ACTUATED BY TOOL OR WORK APPROACH		
DIG 60	PROGRESSIVE DISPLACEMENT OF HOOD		
DIG 61	PLURAL-TYPE DEBRIS REMOVERS		
DIG 62	RUBBING TRANSFER OF SOLID COATING TO ROTATING ELEMENT		
DIG 63	FLUID CONVEYOR OR APPLICATOR		
DIG 64	AMBULATORY CUTTER WITH FLUENT CONDUIT		
DIG 65	CUTTER CONTAINED SUPPLY RESERVOIR		
DIG 66	FLUID FLOW TO CHANNELED CUTTER		
DIG 67	ROTATING CUTTER		
DIG 68	HOLLOW SPINDLE CONTAINS		
DIG 69	FLUID SPREADER CONTACTS CUTTER		
DIG 70	ROTARY OR OSCILLATING FLUID APPLICATOR		
DIG 71	COMPLETE IMMERSION OF CUTTER		
DIG 72	DIP OR SPLASH SUPPLY		
DIG 73	CHAIN OR BELT CONVEYOR		
DIG 74	PARTIAL IMMERSION OF CUTTER		
DIG 75	ADJUSTABLE LIQUID LEVEL		
DIG 76	MOVABLE LIQUID-CARRYING TROUGH		
DIG 77	WITH SEPARATOR OR FILTER		
DIG 78	AIR BLAST AND/OR VACUUM CONVEYOR		
DIG 79	REMOVABLE DEBRIS RECEPTACLE		

